TRI-AGENCY FORECAST DISCUSSION FOR JULY 22, 2010

Tropical Areas of Interest Discussion: Created 1800 UTC July 22, 2010

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Summary: A late-day organization of convection and vorticity began yesterday and continued overnight with PGI-17L/AL97 such that this morning the chances for formation were upgraded by the NHC to 100%, resulting in the 1500 UTC classification of the system as Atlantic Tropical Depression #3 (TD3). This system now has a defined center of circulation clearly visible by satellite and has improved organization of convection today. The upper level cold low to the NW of TD3 has moved westward more quickly than TD3, resulting in TD3's more favorable environmental conditions. Less wind shear, overcoming mid-level dry air intrusion yesterday, and slightly improving upper level divergence over the system have aided development thus far. Flight investigations by multiple agencies are underway and expected to continue for at least the next two days. Another system, stemming from the northern extent of PGI-16L/AL98 , has formed a broad center of circulation early this morning and has a medium chance for development (NHC), though it will move inland on the central Mexican Gulf coast within the next 24 hours. No flight investigations are expected with that system.

Nowcast: 1800 UTC July 22, 2010

Three tropical waves in the Atlantic continue to be monitored by the GRIP, IFEX, and PREDICT teams. These include PGI-16L/AL98, PGI-17L/AL97/TD3, and the tropical wave with a formerly associated pouch PGI-18L. (*see **1a***) AL98 is located in the SW Gulf of Mexico near 20N, 96W. TD3 is located at 22N, 75W. PGI-18L is no longer being tracked on the Montgomery website and there has not been persistent deep convection, however the position of this wave is between 20N, 47W and 2N,43W and satellite imagery indicates broad cyclonic flow (*see **1b***). Operations have focused on TD3 for the past several days, and it was upgraded by the National Hurricane Center (NHC) from an Invest to a Tropical Depression at 1500 UTC today after satellite imagery began to indicate a closed circulation had developed. Tropical Storm warnings have been issued for the FL Keys and south Florida coasts on both the Gulf and Atlantic sides. (*see **1c***) Ft Lauderdale is currently under a tropical storm watch.

The system continues to be under the influence of a strong upper tropospheric cold low which is helping to maintain a strong shear gradient near the center of TD3. 1500 UTC CIMSS analysis shows shear greater than 20 kts within a few degrees NW of the storm center. However, to the east of the storm and over the center, shear is only 5-10kts. (*see **2***)Thus, convection is limited to the eastern side of the low and west side convection is currently inhibited by dry air at mid levels, high shear and land influences. Upper level diffluence is also only marginally favorable; however some good outflow is observable over the eastern half of the storm (*see **3***) and banding features can also be seen. SSTs and atmospheric moisture content over the storm center remain conducive for development, however Ocean Heat Content is not particularly high, and, as previously mentioned, dry air at mid levels is present to the west of the center of circulation (*see **4,5,6***). Compared to yesterday, the low level vorticity is far more concentrated, and well stacked vertically. As long as the low level center does not move ahead of the convection, it appears that there is a good chance for development into a tropical storm in the short term. Flight operations including all 3 NASA aircraft as well as NOAA aircraft are planned over the next 3 days for this system.

The NHC has also issued an Invest classification on PGI-16L, now AL98, and there is a 50% probability of development within the next 48 hours. The 0600 UTC Ocean Prediction Center places a 1010 hPa low in AL98's location, and widespread deep convection is occurring around the low. Wind shear is low in this region and SSTs are sufficiently high to support genesis. However, the low is very near land, and should reach the coast of Mexico within the next 24 hours, limiting its chances for development. Elsewhere in the Atlantic, a pair of 1027 hPa subtropical highs is dominating the flow resulting in largely easterly surface winds from Africa through the Gulf of Mexico. A tropical wave which separated from TD3 is being analyzed in the Caribbean at 15N, 80W however no convection is currently associated with this system.

Forecast: 1800 UTC July 22, 2010

TD3: The primary forecast concern is TD3 which is centered at 22N, 75W moving WNW at 13 kts. Overnight it began to show signs of development and a closed circulation formed. However, several factors are still hindering the development of TD3. This includes mid level dry air to the west of the storm, terrain influences from Cuba, and persistent shear to the west. The cold low is moving faster than the depression, and has moved south and west away from TD3, effectively decreasing the shear immediately over the center of the depression, and changing the direction of the shear from SW to S. The cold low is forecasted to move SW, and as it does so the shear is expected to eventually turn to the SE over TD3, as indicated by the SHIPS text forecast (*see **7***). While the shear is not expected to be particularly favorable for development, it also is not expected to be extremely unfavorable either. Another consideration of the cold low is that as it moves farther ahead of the depression, the downstream ridging supporting convection near Hispaniola may set up over TD3, creating a more favorable upper level environment.

The model track guidance for TD3 has a fairly good consensus (*see **8***). Almost all of the 1200 UTC model forecasts bring TD3 between Cuba and the Keys, with the northern most tracks bringing the center over the Keys. Within 36 hours, the system will have emerged into the Gulf, continuing a steady NW heading. Most models then forecast a gradual northward turn, resulting in an eventual landfall along the Louisiana or Northern Texas coasts within 72-96 hours. The National Hurricane Center is predicting a track near the center of the model spread with a landfall in about 84 hours at the Louisiana-Texas border. This track seems reasonable, and should not deviate substantially.

The model intensity forecast spread continues to be split between the statistical-dynamical models, which continue to strengthen the system into a moderate tropical storm before it makes landfall, while the dynamical models show little to no strengthening, and in fact suggest the system will gradually weaken (*see **9***). Due to the system's updated classification to a depression, the DSHIPS/LGEM developmental data is now applicable and more stock can be placed in those forecasts. The NHC official forecast lies in the middle of the model spread with very slight strengthening over the next several days before landfall as a 45kt tropical storm, while SHIPS and LGEM suggest a landfall intensity closer to 55kts. Pouch tracking analysis utilizing the GFS and NOGAPS 0000 UTC model forecasts show initially high O-W and Zeta values that quickly decrease, however both level off around the nominal threshold for development, suggesting that further development remains a possibility (*see **10***). While substantial

strengthening is not anticipated, it seems likely that the system will intensify into a weak tropical storm within the next 24-48 hours.

Links to resources used in discussion:

1a: Montgomery site analysis http://www.met.nps.edu/~mtmontgo/storms2010.html

1b: Updated 1200 UTC TPC analysis http://www.nhc.noaa.gov/tafb/ATSA_12Z.gif

1c: NHC forecast/warnings graphic
http://www.nhc.noaa.gov/refresh/graphics_at3+shtml/145913.shtml?radii#contents

2: CIMSS shear product http://cimss.ssec.wisc.edu/tropic2/real-time/windmain.php?&basin=atlantic&sat=wg8&prod=shr&zoom=&time=

3: Visible satellite of TD3: http://www.ssd.noaa.gov/goes/flt/t1/vis-l.jpg

4/5: http://isotherm.rsmas.miami.edu/heat/webmini/mini.php

6: Water Vapor still: http://www.ssd.noaa.gov/goes/east/tatl/wv-l.jpg

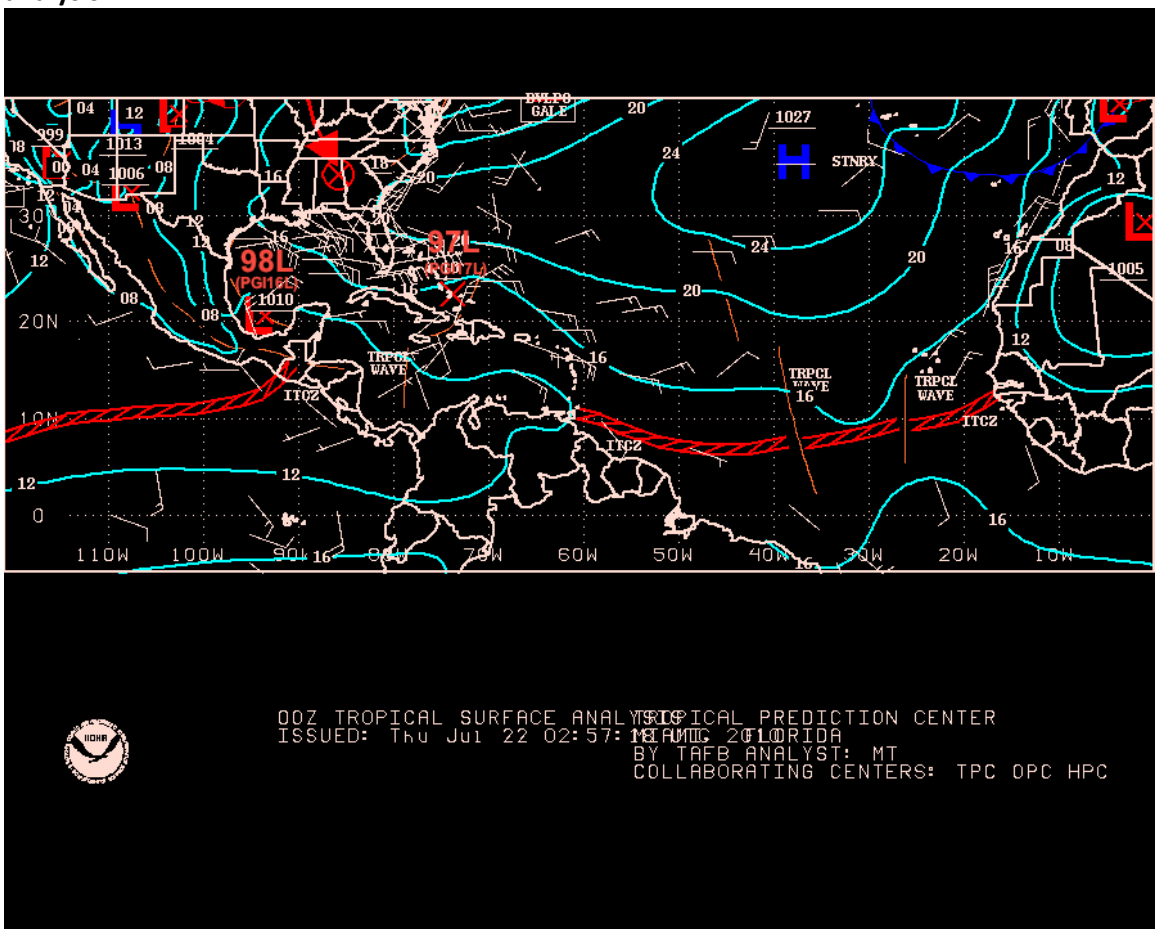
7: SHIPS forecast
ftp://ftp.tpc.ncep.noaa.gov/atcf/stext/10072212AL0310_ships.txt

8/9: 12Z model track and intensity guidance from Clark Evans' site:
http://moe.met.fsu.edu/~acevans/models/

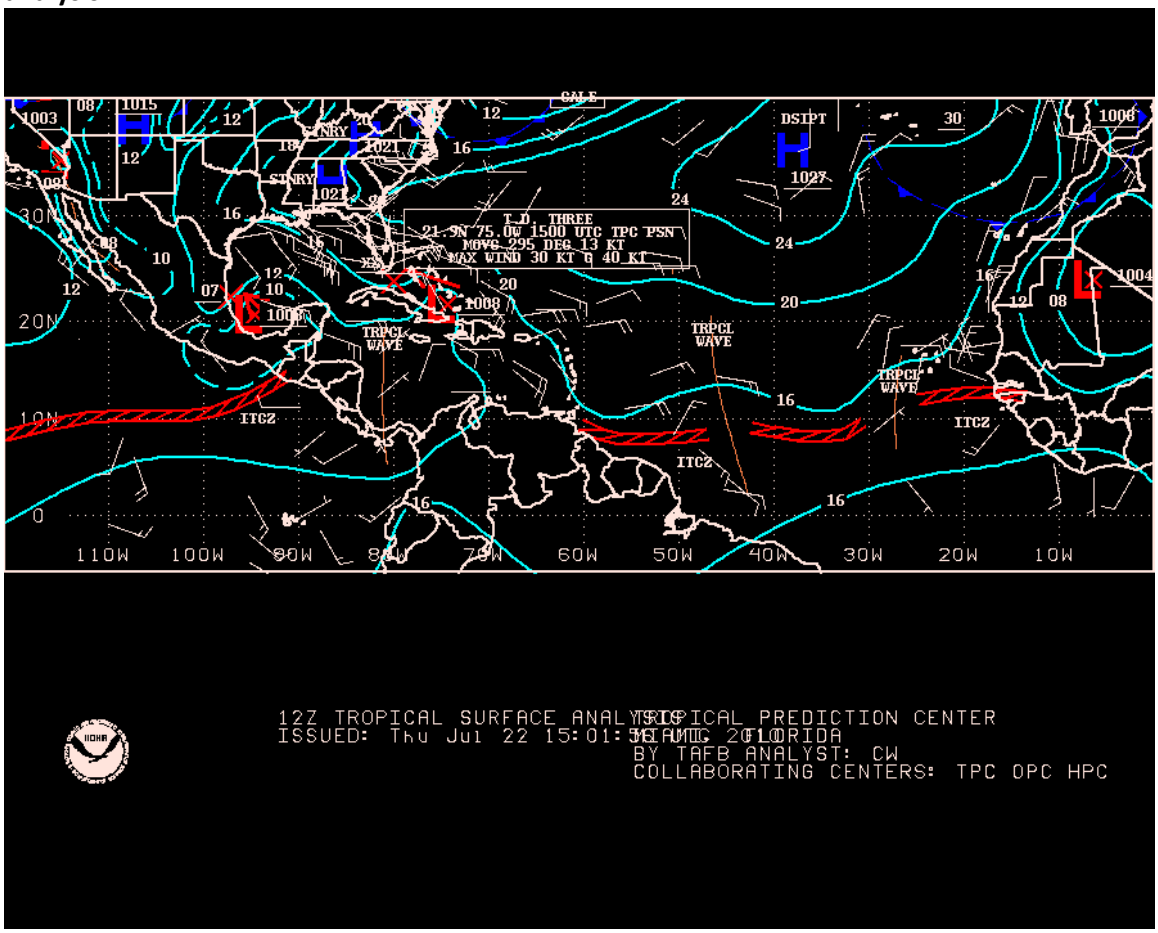
10: GFS forecast for pouch tracking (only 00Z available):
http://www.met.nps.edu/~mtmontgo/storms2010/PGI17L/2010072200/gfs/PGI17L.track-gfs.2010072200.gif

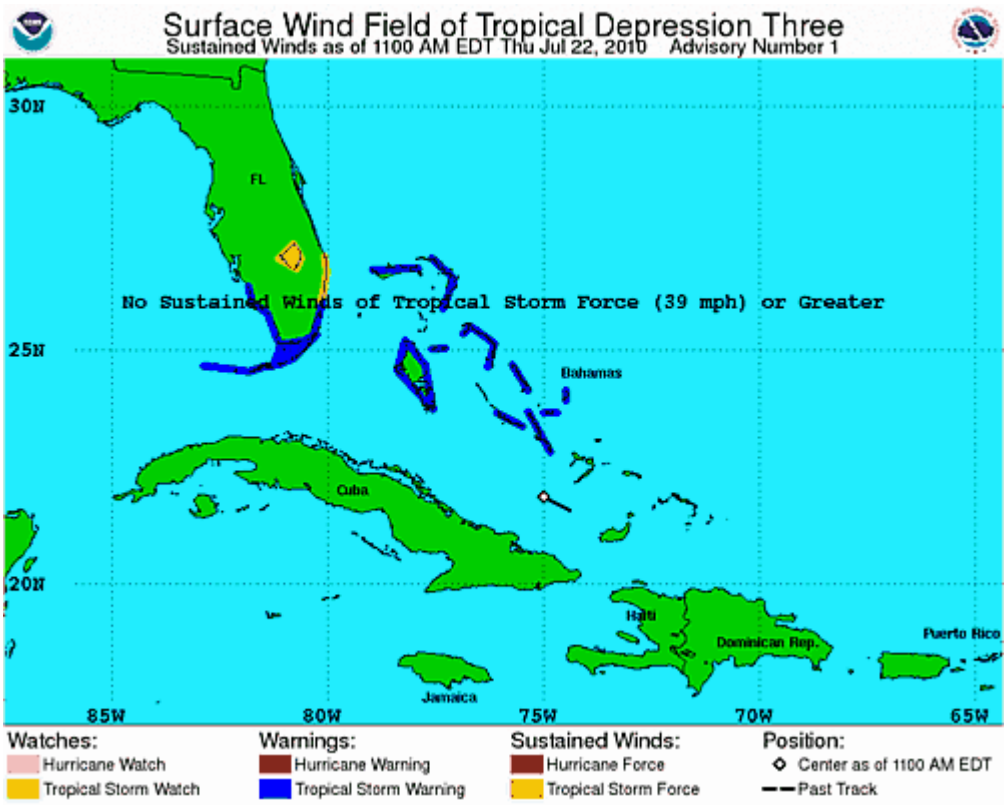
Static Images used in discussion:

1a) 0000 UTC Surface analysis plus Montgomery analysis



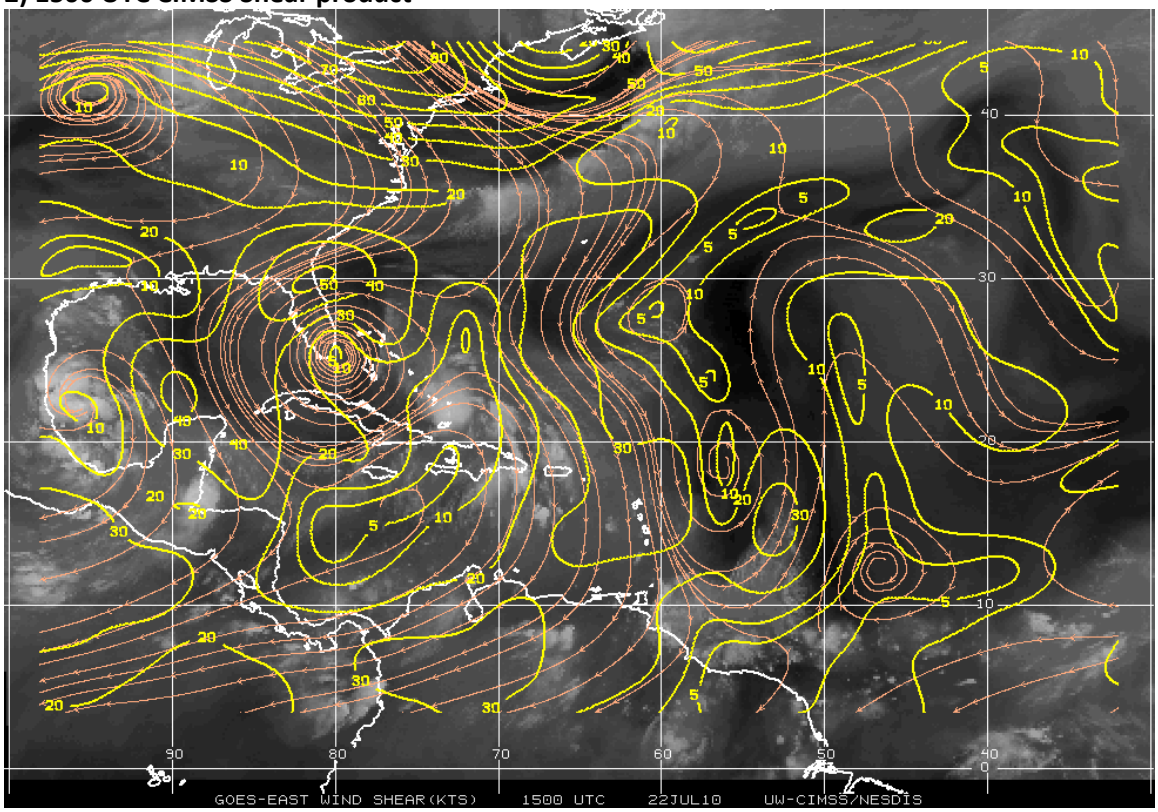
1b) Updated 1200 UTC TPC analysis



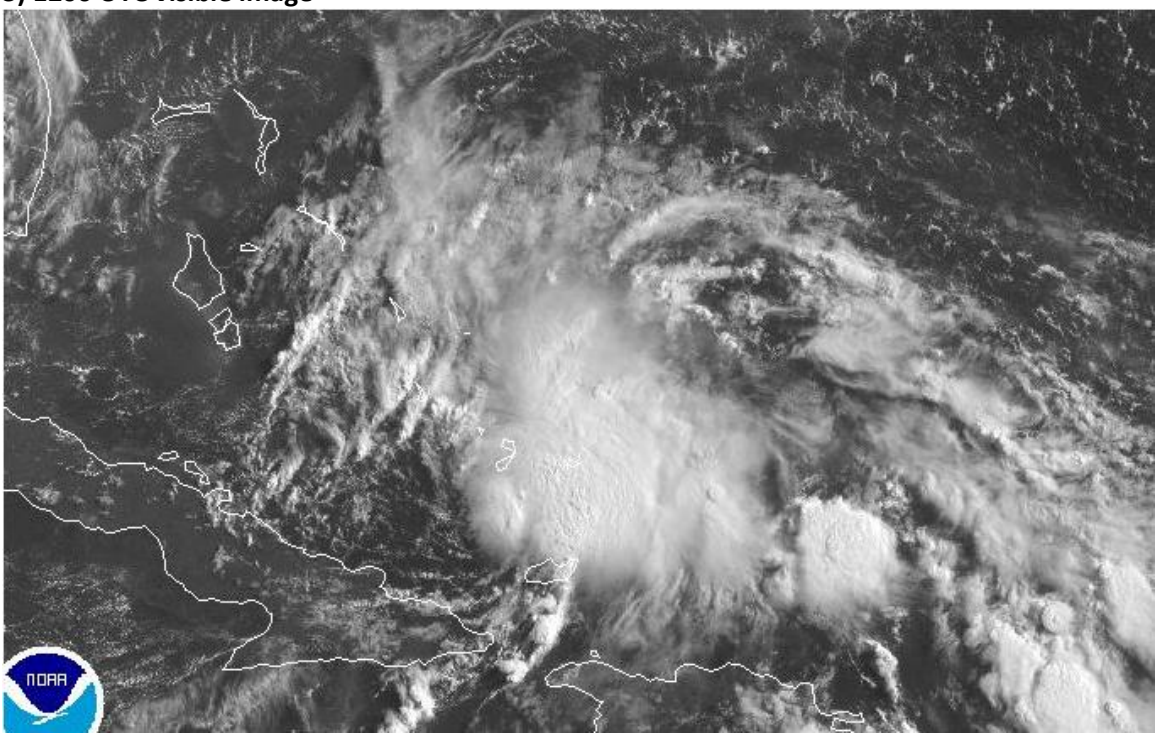


1c)

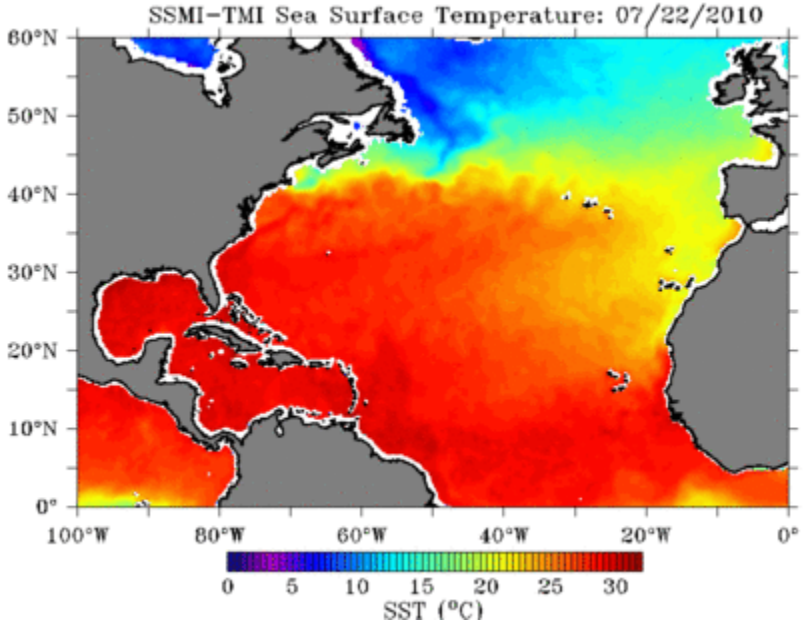
2) 1500 UTC CIMSS Shear product



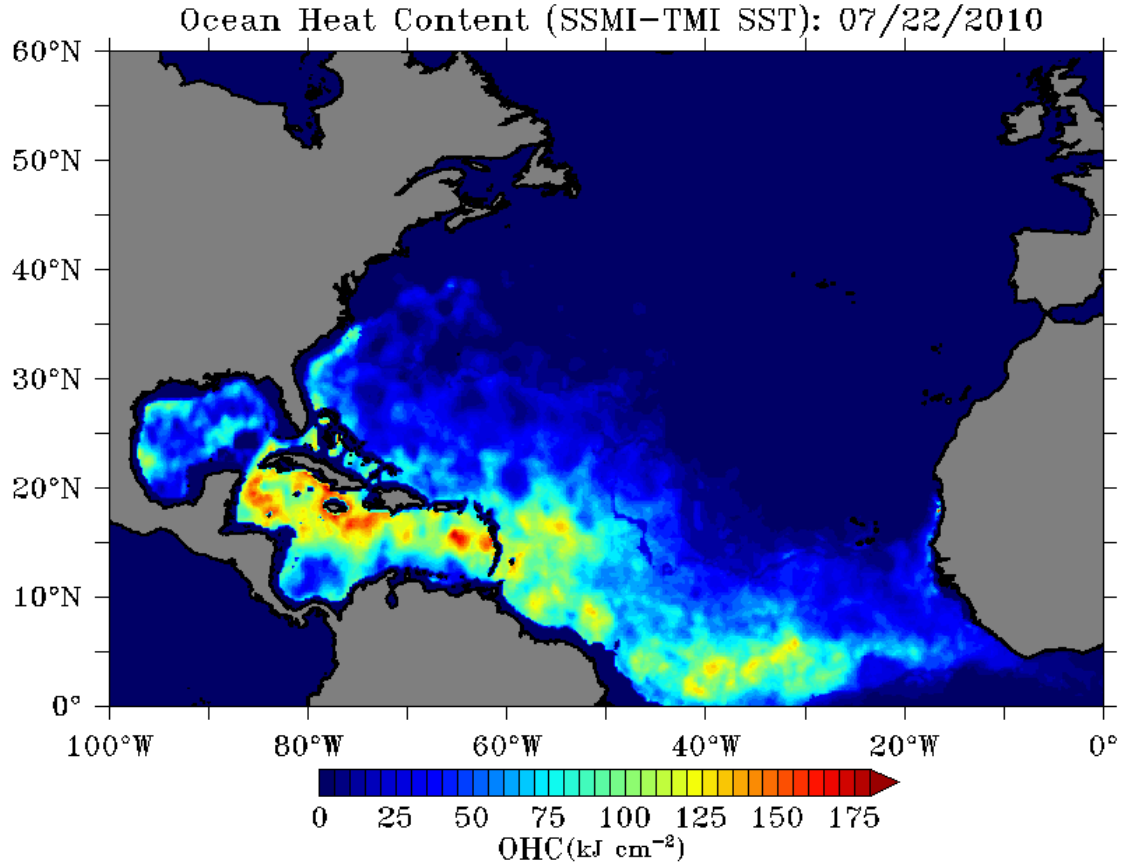
3) 1200 UTC visible image



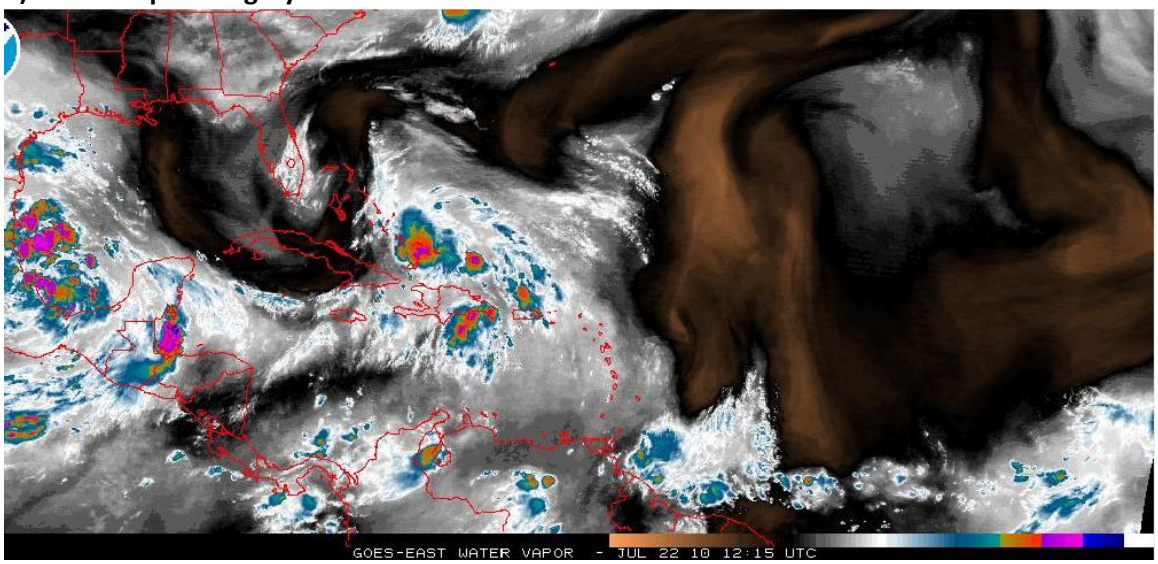
4) SST analysis



5) Ocean Heat Content analysis



6) Water Vapor Imagery 1200 UTC



7) SHIPS Forecast July 22

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                  *   ATLANTIC SHIPS INTENSITY FORECAST       *
                  *      GOES DATA AVAILABLE                  *
                  *      OHC  DATA AVAILABLE                  *
                  *       THREE  AL032010  07/22/10  12 UTC   *

TIME (HR)          0     6     12    18    24    36    48    60    72    84    96   108   120
V (KT) NO LAND    30    31    32    34    37    41    45    48    52    54    55    55    53
V (KT) LAND       30    31    32    34    37    41    45    48    52    54    37    30    28
V (KT) LGE mod    30    31    32    33    35    39    42    44    48    53    37    30    28

SHEAR (KT)        11    13    14     9    17    18    22    13    11    14    17    12     5
SHEAR ADJ (KT)     0    -1     0    -1    -1     3    -1     1    -2     2    -4     5     0
SHEAR DIR        224   166   149   115   101   122   104   134    88   140   133   162   132
SST (C)         29.5  29.5  29.6  29.7  29.8  29.9  29.7  29.5  29.7  29.8  29.0  26.3  24.0
POT. INT. (KT)   160   161   163   165   167   169   165   161   165   166   152   117    97
ADJ. POT. INT.   148   150   153   155   156   158   151   146   146   146   131   100    84
200 MB T (C)   -52.8 -52.4 -52.4 -52.3 -52.4 -51.8 -52.2 -51.7 -52.1 -51.7 -52.3 -51.6 -51.7
TH_E DEV (C)      10    11    11    10    10    11    10    12     9    13     9    14     8
700-500 MB RH     61    59    60    54    52    52    51    55    56    53    58    58    55
GFS VTEX (KT)     11    12    12    11    12    10     8     5     5     3  LOST  LOST  LOST
850 MB ENV VOR    29    39    36    28    22    -6   -27   -65   -81   -70   -82   -37   -33
200 MB DIV        17    13   -25   -15    -1   -17    -7     4     1    -6   -14     7   -18
LAND (KM)        118   120   122   109   117    78   249   273    80    14  -109  -332  -538
LAT (DEG N)     21.6  22.1  22.6  23.2  23.7  25.0  26.1  27.3  28.4  29.5  30.7  32.4  34.1
LONG(DEG W)     74.4  75.6  76.7  78.0  79.3  81.9  84.8  87.4  89.9  92.1  94.2  95.8  96.7
STM SPEED (KT)    10    12    12    13    13    14    13    13    12    11    11    10     9
HEAT CONTENT      79    73    53    53    86     2    68    25    40     2    25     0     0

  FORECAST TRACK FROM BAMM      INITIAL HEADING/SPEED (DEG/KT):280/  9      CX,CY:  -8/  2
  T-12 MAX WIND:  30            PRESSURE OF STEERING LEVEL (MB):  490  (MEAN=624)
  GOES IR BRIGHTNESS TEMP. STD DEV.  50-200 KM RAD:  27.5 (MEAN=14.5)
  % GOES IR PIXELS WITH T < -20 C    50-200 KM RAD:  32.0 (MEAN=65.0)
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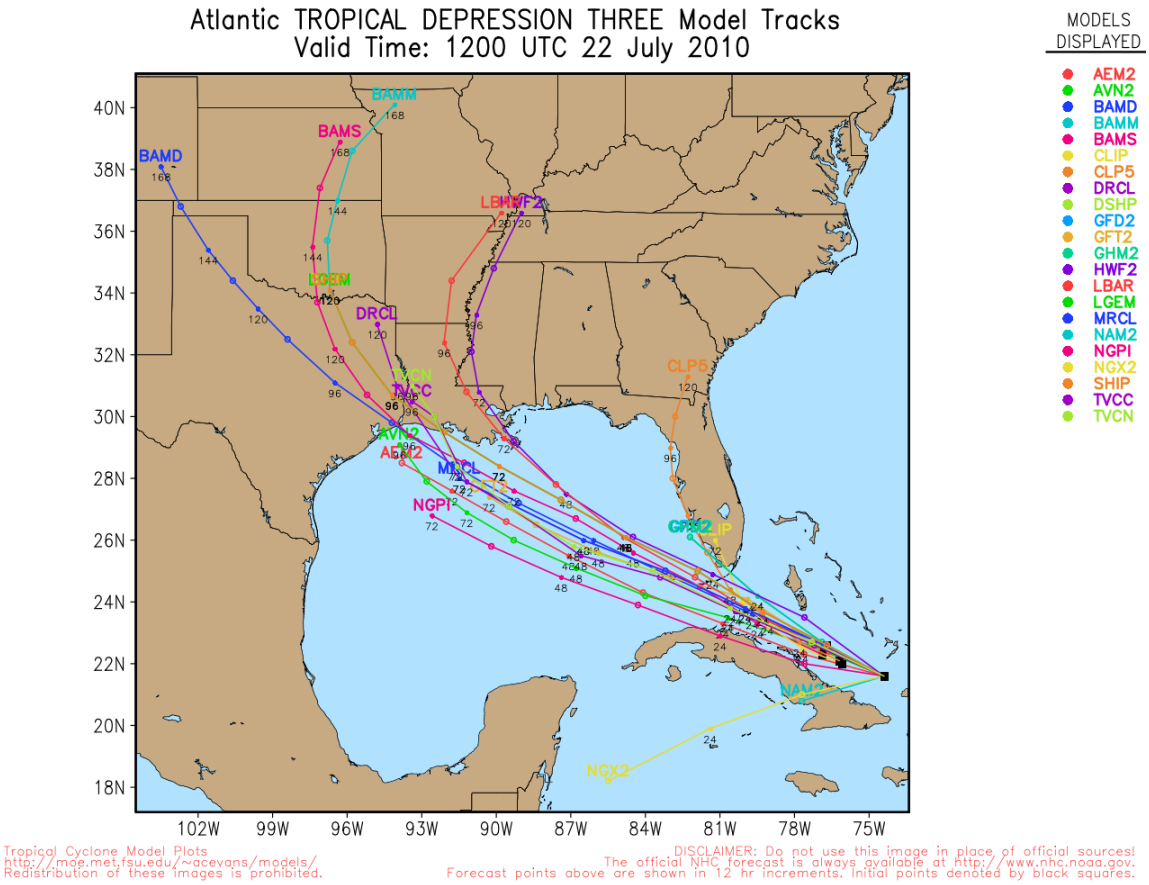
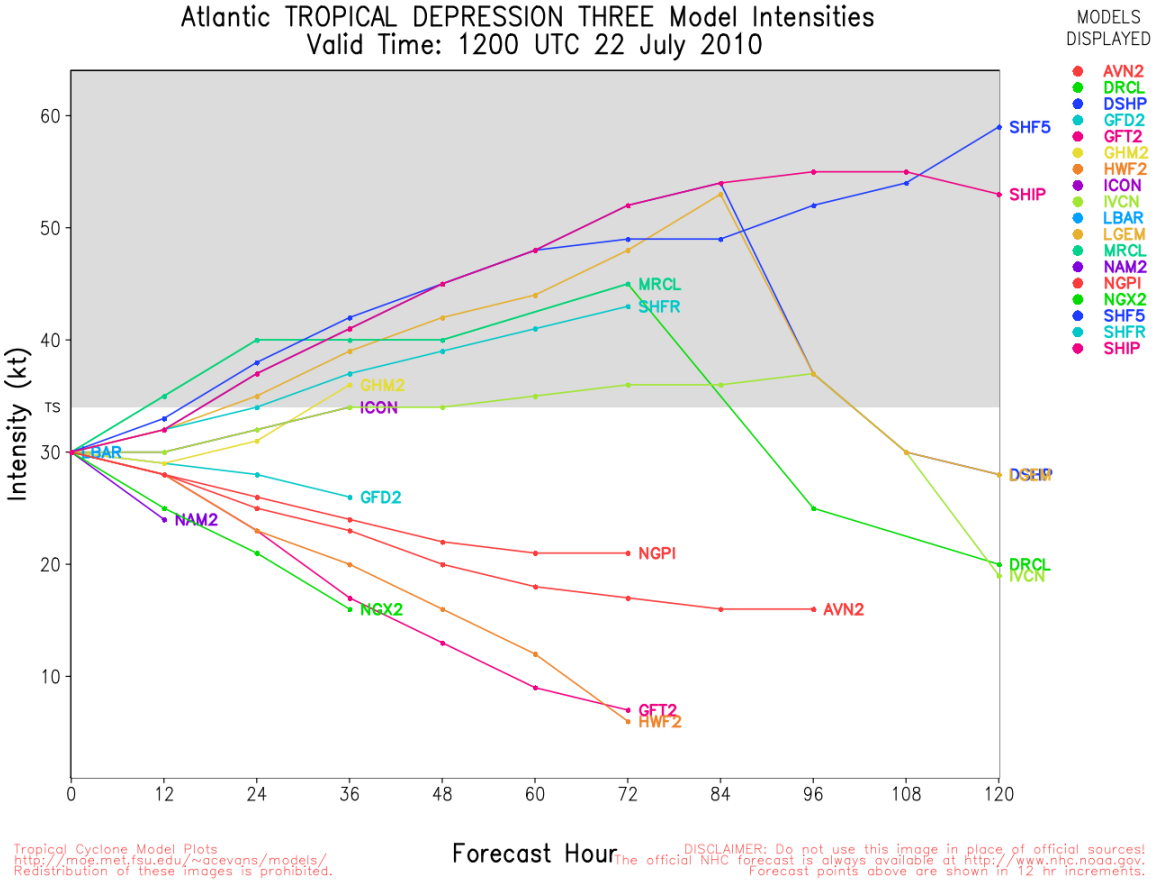
8)



9)


Atlantic TROPICAL DEPRESSION THREE Model Intensities
Valid Time: 1200 UTC 22 July 2010
MODELS DISPLAYED
AVN2
DRCL
DSHP
GFD2
GFT2
GHM2
HWF2
ICON
IVCN
LBAR
LGEM
MRCL
NAM2
NGPI
NGX2
SHF5
SHFR
SHIP
Intensity (kt)
TS
Forecast Hour
Tropical Cyclone Model Plots
http://moe.met.fsu.edu/~acevans/models/
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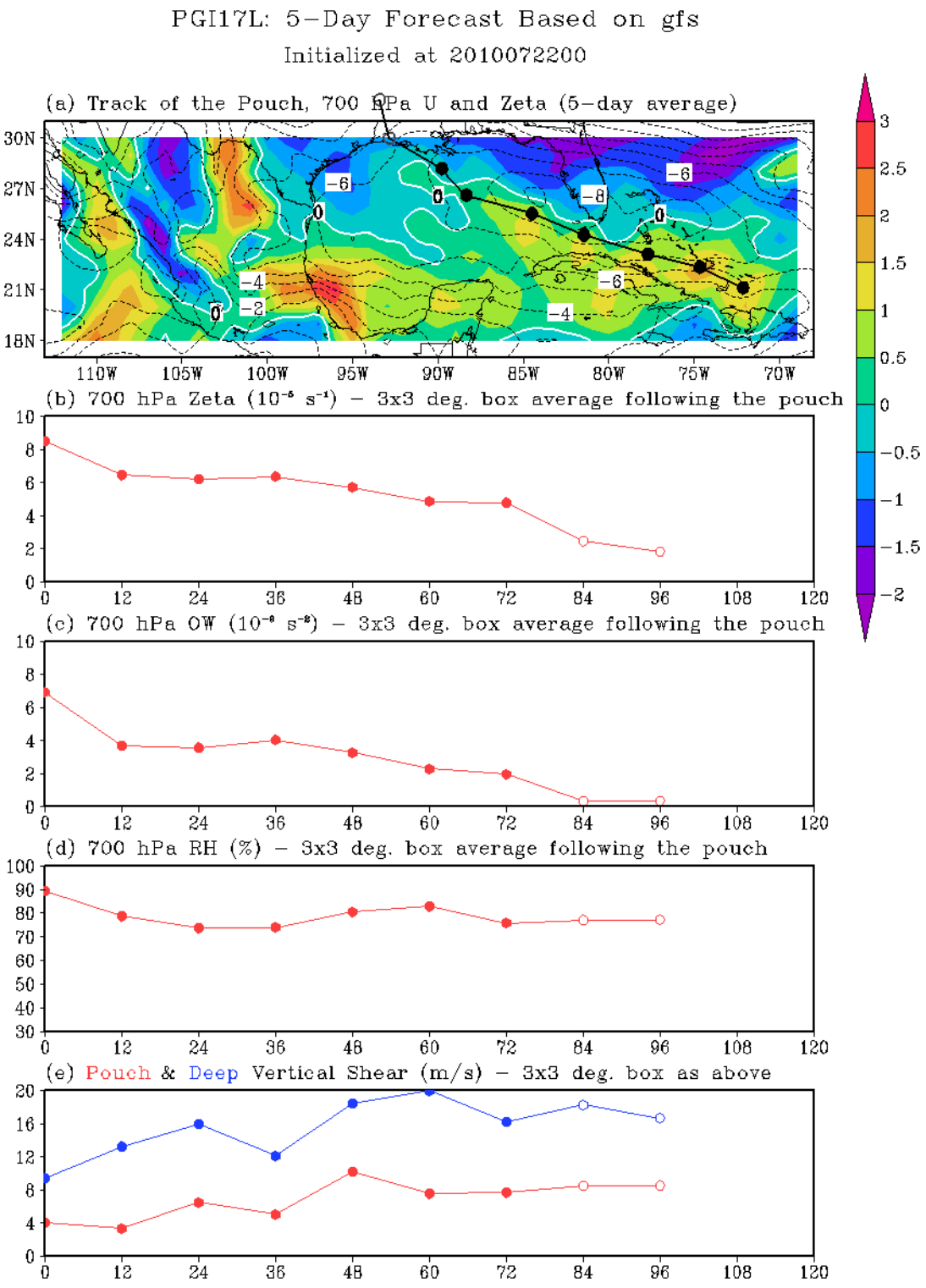
DISCLAIMER: Do not use this image in place of official sources!
The official NHC forecast is always available at http://www.nhc.noaa.gov.
Forecast points above are shown in 12 hr increments.

10)


PGI17L: 5-Day Forecast Based on gfs
Initialized at 2010072200
(a) Track of the Pouch, 700 hPa U and Zeta (5-day average)
30N
27N
24N
21N
18N
110W
105W
100W
95W
90W
85W
80W
75W
70W
-6
0
-8
-4
-2
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
(b) 700 hPa Zeta (10^{-5} s^{-1}) - 3x3 deg. box average following the pouch
(c) 700 hPa OW (10^{-8} s^{-2}) - 3x3 deg. box average following the pouch
(d) 700 hPa RH (%) - 3x3 deg. box average following the pouch
(e) Pouch & Deep Vertical Shear (m/s) - 3x3 deg. box as above
0
12
24
36
48
60
72
84
96
108
120